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SECTION 1-2

Properties of Waves

(pages 18–23)

This section describes the basic properties of waves. It also explains how a wave's speed is related to its wavelength and frequency.

▶ Introduction (page 18)

1. What are the basic properties of waves?

a. _____ b. _____

c. _____ d. _____

CHAPTER 1, Characteristics of Waves *(continued)*

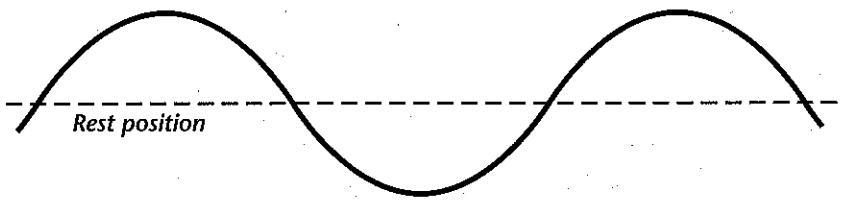
▶ Wave Diagrams (pages 18–19)

2. On the transverse wave in Figure 5 on page 19, what does the line called the rest position represent? _____

_____

_____

3. On the wave diagram below, label a crest and a trough.



4. If you were to draw a longitudinal wave, you should think of the compressions as _____ on a transverse wave and the rarefactions as _____ on a transverse wave.

▶ Amplitude (pages 19–20)

5. The maximum distance the particles of the medium carrying a wave move away from their rest position is called the wave's _____.

6. Explain what the amplitude of a water wave is. _____

_____

_____

7. The amplitude of a wave is a direct measure of its _____.

8. What is the amplitude of a longitudinal wave? _____

_____

_____

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9. Circle the letter of each phrase that correctly defines the amplitude of a transverse wave.

   a. The distance from the bottom of a trough to the top of a crest

   b. The maximum distance the particles of the medium move up or down from their rest position

   c. The maximum distance from one point on the rest position to another point on the rest position

   d. The distance from the rest position to a crest or to a trough

10. Suppose a longitudinal wave has crowded compressions and loose rarefactions. Does it have a large or a small amplitude?

    _____

▶ Wavelength (page 21)

11. The distance between two corresponding parts of a wave is its

    _____.

12. How can you find the wavelength of a longitudinal wave? _____

    _____

▶ Frequency (page 22)

13. The number of complete waves that pass a given point in a certain amount of time is called the wave's _____.

14. If you make a wave in a rope so that one wave passes every second, what is its frequency? _____

15. Circle the letter of the unit used to measure frequency.

    a. watt **b.** seconds **c.** joule **d.** hertz

▶ Speed (pages 22–23)

16. The speed of a wave is how far the wave travels in one unit of

    _____.

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CHAPTER 1, Characteristics of Waves *(continued)*

Complete the following formulas.

17. Speed = _____

18. Frequency = _____

19. Wavelength = _____

20. Circle the letter of each sentence that is true about the speed of waves.

    a. All sound waves travel at the same speed.

    b. In a given medium and under the same conditions, the speed of a wave is constant.

    c. If the temperature and pressure of air changes, the speed of sound waves traveling through the air will change.

    d. Waves in different mediums travel at different speeds.

21. If you increase the frequency of a wave, the wavelength must _____.